Preliminary (16.8) lecture plan for TTT4120 fall 2023

Lecture plan for Proakis & Manolakis, Digital Signal Processing, **4th edition**, Prentice-Hall, 2007

Week	Day	Topic	In the textbook	Exercise deadline
34	Tue	Introduction to digital signal processing Time-discrete signals in time domain	1.1, 1.2, 1.4.1 2.1, 1.3	
	Wed	Time-discrete systems in time domain	2.2, 2.3, 2.4.1, 2.4.2, 2.5.1	
35	Tue	Time-discrete systems in time domain Time-discrete signals and systems in frequency domain. The discrete time Fourier transform (DTFT)	4.2.1, 4.2.3, 4.3, 4.4, 5.1.1, 5.1.4, 5.4.1	
	Wed	More on DTFT. Laplace transform (analogue systems)	Lecture notes	
36	Tue	z-transform (analysis of digital systems)	3.1, 3.2, 3.3	
	Wed	z-transform (analysis of digital systems) Relationship between H(ω) and poles and zeros	4.2.6, 3.5.3, 3.5.6 5.2.2	1 (8.9)
37	Tue	Properties of some simple filter types Linear phase response and group delay Minimum phase and inverse systems	5.4.2-5.4.6 5.4.1, 10.2.1 5.5	
	Wed	Correlation and energy spectral density	2.6.1, 2.6.2, 2.6.4, 4.2.5, 5.3.1	2 (15.9)
38	Tue	Inverse z-transform and residuals	3.4	
	Wed	The sampling theorem	1.4.2, 1.4.6, 6.1	3 (22.9)
39	Tue	Sampling in frequency domain, DFT DFT properties	7.1.1, 7.1.2 7.2 (main points)	
	Wed	Use of DFT in filtering Use of DFT in frequency analysis	7.3.1, 7.3.2 7.4	4 (29.9)
40	Tue	FFT - efficient computation of DFT	8.1.1, 8.1.3	
	Wed	Characterization of stochastic processes	1.2.4,12.1, lecture notes	
41	Tue	Characterization and filtering of stochastic processes	12.1, lecture notes 5.3	
	Wed	Filtering of stochastic processes Estimation: general theory, mean value	5.3 12.1, lecture notes	5 (13.10)
42	Tue	Estimation: autocorrelation, power spectrum, non-parametric spectral estimation.	12.1, 14.1.2, 14.1.3, 14.2.1	
	Wed	Modeling stochastic processes Parametric spectral estimation	12.2 14.3	6 (20.10)
43	Tue	More on parametric spectral estimation	14.3 (start to 14.3.3), 14.3.6	
	Wed	Linear prediction	12.3.1, 12.3.4	7 (27.10)
44	Tue	Design of FIR- and IIR-filters	10.2.2, 10.2.4 (main idea)	
	Wed	Design of IIR-filters Wiener-filtering		
45	Tue	Wiener-filtering	12.7.3, 12.7.4	
	Wed	Filter implementation	9.1-9.3,1.4.3, 6.3.3, 9.4.1, 9.4.3	8 (10.11)
46	Tue	Filter implementation	9.6.2, 9.6.3	
	Wed	Preliminary: Guest lecture	"Medical Signal Processing", Prof. Hans Torp	9 (17.11)
47	Tue	Multirate signal processing	11.1-11.3	
	Wed	Multirate signal processing Summary	11.4, 11.6	10 (24.11)
48				11 (28.11)